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WEEKLY STATION REPORTS

OF THE DIVISION OF

DRY LAND AGRICULTURE

BUREAU OF PLANT INDUSTRY

U. S. DEPARTMENT OF AGRICULTURE

JAN 1941

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REPORT FOR THE MONTH OF JANUARY 1941.

HAVRE: Report for the month of December 1940.

December might be classed as an exact opposite of November. The mean temperature was 8.2° above the Station average, precipitation was only 0.03 inch, which is a 24-year record low for the Station, and wind movement was light. With the exception of December 1 and December 11 to 17, minimum readings were all above zero. The relatively warm weather during the greater part of the month resulted in some resumption of growth of winter cereals and crested wheatgrass.

Reviewing the weather during the past year, the following may be of interest:

	1940	
Annual precipitation	12.43 ins.	11.76 ins. normal
May to August rainfall	5.25 ins.	6.97 ins. normal
Total snowfall	53.8 ins.	36.5 ins. normal
Annual mean temperature	43.2°	42.4° normal
May to August mean temperature	65.5°	63.7° normal
Frost-free period, April 24 to October 13,	172 days	129 days normal
Highest temperature	107°	107° extreme
Lowest temperature	-35°	-48° extreme
Annual wind velocity (2 ft. anemometer)	6.10 MPH	6.20 MPH normal
May to August wind velocity	5.55 MPH	5.63 MPH normal
April to September evaporation	30.110 ins.	28.749 ins. normal

The individual feeding trials, involving 40 heifer calves and 33 yearling heifers, were begun on December 6. The calves responded more uniformly during the first period than they did last year for a corresponding period. Feed consumption was also greater. The yearling heifers likewise made quite uniform gains.

Maximum temperature, 59°; minimum, -19°; precipitation, 0.03 inch.

HAVRE:

Mild temperatures and about normal precipitation prevailed. The ground was bare practically all of December and January, which may have some detrimental effect upon winter grains.

The second period of the individual feeding trials was terminated January 30. Good gains resulted in practically all lots. The cow herd is being fed miscellaneous hays.

The Superintendent was called upon to participate in the program of Feeders' Tours held at Chinook, Fairfield, and Conrad. Ray Woodward is now in Bozeman analysing data collected at this station in connection with the type and plane of nutrition studies, involving Hereford cattle.

Maximum temperature, 57°; minimum, -14°; precipitation, 0.38 inch; snowfall, 3.9 inches.

MOCCASIN:

Temperatures during the month were high except for two periods when minimums dropped below zero. The mean temperature was 28.8° compared to the average station mean of 20°. The weather has been especially favorable for all livestock; whether or not these climatic conditions damaged fall-sown crops connot be accurately determined until spring.

The total precipitation was 0.04 inch, the lowest yet recorded at this station for the month of January. Thus the total precipitation for December and January is less than 0.10 inch. There were few days with wind velocities exceeding 10 miles per hour.

The steers in the Winter Feeding and Pasture Experiment were weighed on the 14th, the end of the second 28-day period. The weights of the steers for the two periods to date are as follows:

Lot	Kind of hay or feed	Initial wts. 11-19-40	1st period 12-17-40	Gain per steer	Hay per steer	2nd period 1-14-41	Gain per steer	Hay per steer
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
A	Fairway crested wheatgrass (Cut prior to bloom)	451	501	51	10	533	31	9½
B	Standard crested wheatgrass (Cut prior to bloom)	452	496	44	11	529	34	9½
C	Standard crested wheatgrass (Cut about 2 wks. after bloom)	449	493	44	10	526	34	10
D	Mature crested wheatgrass pasture.	453	488	35	--	513	25	--

There are 8 steers in each lot, and each steer receives in addition to the hay 3 pounds of cottonseed meal-beet pulp-molasses pellets.

Maximum temperature, 66°; minimum, -11°; precipitation, 0.04 inch.

HUNTLEY:

The comparatively mild weather of December extended through January and established a new low record for January precipitation at this station. Enough snow to cover the ground fell twice during the month, but most of it melted within 24 hours and was of little value either as an addition to the soil moisture or as a protection to winter wheat.

The action of drought and frost has cracked the ground deeply in many places. This condition is the most extreme in planted land such as plots of alfalfa, crested wheatgrass, and winter grains. Despite the lack of snow cover during the month, no soil blowing has taken place in this area, notwithstanding the fact that wind movement has been high on several days.

Maximum temperature, 61°; minimum, -6°; mean, 27°; average mean, 18°; precipitation 0.08 inch; average, 0.71 inch.

SHERIDAN:

Except for the first week the month was mild, with a mean temperature about 4° above the average for January. Below zero temperatures were reached on the first five days of the month, but there were no extreme temperatures at any time. Precipitation was only a little over one fourth the average for January, and wind movement was low. There was a light cover of snow during the coldest weather, but the month ended with no snow on the ground except on north slopes. Run-off from melting snow over the last week was high in proportion to the amount of snow that has fallen since the ground was last clear of snow. No field work was possible at any time during the month.

Maximum temperature, 52°; minimum, -8°; precipitation, 0.16 inch.

MANDAN:

Arboriculture:

The end of 1940 completed 25 years of investigational work on farms relative to establishing farm building windbreaks on the northern Great Plains. The majority of factors that might be expected to influence either favorably or unfavorably the success with windbreaks have very probably been present during that period. Those windbreaks which are doing the work in a satisfactory manner for which planted are classed as "survivors" while those which fail to perform this function through loss of trees or other factors are classed as "losses". Survivors may not have survivals of 100 percent of the trees planted but do have a survival sufficient to perform their function satisfactorily. The following table shows the combined average survivals of windbreaks planted during the 21-year period, 1916-36, at 5, 10, 15, 20, and 25 years of age for the States of Montana, North Dakota, and South Dakota.

Combined average survival of windbreaks planted during the 21-year period 1916-36, at 5, 10, 15, 20, and 25 years of age.

State	Years of age				
	5	10	15	20	25
			percent		
Montana	70	61	50	36	30
North Dakota	81	79	70	52	46
South Dakota	75	68	56	43	22
Average	74	66	56	40	33

The State of Wyoming has not been included in the above summary owing to the transfer of records in 1931 to the Cheyenne station of a large percentage of the windbreaks planted during the years 1916-31. Data on the status of the transferred plantings are not available at this time.

The 5-year data shown in the above table are based on 21 individual planting years. Examination of the single year data shows 1916, 1917, and 1918 plantings to have the lowest survivals of 50, 46, and 43 percent, respectively. Survival was increased to 54 and 76 percent for the years 1919 and 1920, respectively. All years from 1921 to 1934, inclusive, have survivals of 80 percent or above with two of the years exceeding 90 percent. Five-year survival of 1935 and 1936 plantings dropped back to 70 and 53 percent, respectively. The low survivals of the 1916-18 period, were the result of a combination of factors as follows: It being a formative period, extensive use of non-drought resistant species and the use of cuttings rather than rooted planted stock; adverse climatic factors part of the period; and abandonment of plantings the first year through farmers leaving their farms for military service or other essential war industry work. The latter two factors are particularly applicable to the 1918 plantings which have the lowest survival of 43 percent. The downward survival trend of 1935 and 1936 plantings is directly attributable to decidedly adverse climatic factors, severe insect damage, and lack of interest on the farmers' part when little or no income producing crops and feed were produced as a result of adverse conditions then present.

10, 15, 20, and 25-year data are based on 16, 11, 6, and 1 individual planting years. The individual survival data curves for these periods follow very closely the curve of the 5-year data.

Further analysis of the data to determine what percentage of the plantings at a given age have survived satisfactorily the next 5-year period, will be found in the following table:

Percentage of 1, 5, 10, 15, and 20-year plantings which have been survivors at the end of the next 5-year period.

State	Years of age				
	1-5	5-10	10-15	15-20	20-25
	percent				
Montana	70	89	96	98	91
North Dakota	81	96	99	98	98
South Dakota	75	86	81	83	59
Average	73	89	93	94	89

It will be noted that the initial first 5-year period is the period of heaviest mortality. Plantings which survive the initial period have a good chance of reaching an age of at least 20 to 25 years except in South Dakota where a sharp drop takes place between the twentieth and twenty-fifth years. This drop can be attributed to the much more prevalent heavy soils of planting sites in western South Dakota and a combination of adverse climatic and insect factors which were present in that area during the period the plantings were reaching those ages.

Weather:

The month of January was characterized by mild weather, reaching spring-like proportions on the last 3 days of the month. The temperature reached a maximum of 48°, with a maximum range of -2° on the 25th to 48° on the 31st. The minimum temperature for the month was -16°, with a minimum range of 22° on the 31st to the -16° recorded on the 17th.

Considerable thawing and evaporation of the snow occurred during the last week of the month, the snow depth on the ground being estimated at 1.5 inches on the 31st compared to approximately 5.0 inches on the 15th.

The wind velocity for the month was about normal, except for one or two days, notably on the 3rd when the 24-hour average was 16.3 miles per hour.

Total precipitation for the month was 0.31 inches, with 3.8 inches of snow.

BELLE FOURCHE: Report for the month of December 1940.

The weather was abnormally mild, except from December 12 to 17, inclusive, when daily minimum temperatures ranged from 0° to -13°. The mean temperature for the month was 27°, which is 6° higher than the 32-year average mean for December. The sky was frequently overcast with heavy clouds, but precipitation was received on only 9 days, and the amounts were too small to be of much benefit. There were no high winds, and the average wind velocity for December was approximately 25 percent below normal.

The ground was bare most of the month, but relatively little drying of the surface soil occurred, owing to the cloudy weather, low wind movement, and occasional small amounts of precipitation. Fall grain and other dormant crops remain in about the same condition as at the close of November.

Maximum temperature, 55°; minimum, -13°; precipitation, 0.37 inch.

BELLE FOURCHE:

January was unusually mild and dry. The mean temperature for the month was 22°, which is 5° warmer than the average mean for January. Temperatures of 0° or colder were recorded on only 3 days, January 23, 24, and 25, but the weather was relatively cold January 3 to 8 and January 22 to 27. There was much more cloudiness than usual, and a heavy fog prevailed January 13 and 14, during which the ground and pavements were covered with a thin glaze of ice, and over an inch of frost formed on trees, fences, power lines, etc. Precipitation occurred on 13 days, but little more than a trace was recorded in any instance. Less than 1.5 inches of snow were received, and the total precipitation was the third lowest of record for January. Wind movement during the month was abnormally low, but a high wind on January 3 caused some drifting of snow and soil.

The ground thawed sufficiently on a few of the warm days to permit a limited amount of corrugating during the afternoons to control soil blowing. Drying of the surface soil has progressed very slowly, and winter grain remains in good condition.

Maximum temperature, 59°; minimum, -7°; precipitation, 0.07 inch.

ARCHER:

The weather during the month was uniformly mild and pleasant. The usual heavy winds did not occur. Snow fell during the night of January 20, but as there was little wind only small drifts resulted. At the end of the month snow is seen only in protected places.

Winter cereals are in very good condition, and livestock are in better shape than usual.

Mild weather has made possible the cleaning of the barnyards. This work is in progress.

Maximum temperature, 60°; minimum, 4°; precipitation, 0.24 inch.

NORTH PLATTE:

In general the weather for January was mild, the mean temperature being 27°, or approximately 5° above normal. A minimum temperature below zero was recorded only once during the month. The total precipitation was 0.30 inch or 0.9 inch below normal. There were 2.9 inches of snow recorded during the month. The weather was warm enough during the last week to melt most of the snow and remove much of the frost from the ground.

The work of the month consisted largely of completing the reports for the past year.

Maximum temperature, 57°; minimum, -6°.

AKRON:

Temperatures were mild with the only stormy weather in the latter half of the month. A little more than the average precipitation was received. Several light rains fell, and there were several dense fogs. The snow of late December was all melted by the first of the month. Needless to say, the cold-wave threatened from the north did not reach this far south.

October November, December, and January have recorded a total of 1.0 inch precipitation. The average for this period is 2.28 inches. However, more than the average amount of precipitation was received in September, and winter wheat land and other soil surfaces have generally been moist since October. The ground is now covered by snow which fell the 29th.

Maximum temperature, 60°; minimum 5°; precipitation, 0.36 inch.

COLBY:

January was generally warm, calm, and wet with considerable cloudy, misty, foggy, snowy, and rainy weather. It was the third wettest January in the 54 years of record at Colby. Precipitation was recorded on 14 days. It all fell in the form of light snows or easy, misty showers. There were 5.6 inches of snow which netted 0.58 inch of water. The snow drifted some. Several days were foggy. Much oftener than usual there was a deposit of hoar frost, sleet, or ice over everything in the mornings. No damage resulted, however.

There were no high winds, soil blowing, or dusty days. The average wind velocity was the lowest on record for January. The mean temperature was 2° above the average for this station. The mean maximum was about average, but the mean minimum was about 5° above the average. The lowest temperature was -1° on the morning of the 18th. The minimum temperature dropped below freezing every night, but much of the time did not go below 25°.

Although less than an inch of moisture fell, it practically all soaked into the ground. There was almost no run-off, and very little was lost through evaporation as the air was saturated most of the time. There was some snow on the ground on 19 days. The ground was never frozen very deep and always thawed out enough so that the moisture from the rains or melting snow could soak in. During the last week fields, yards, and dirt roads were very muddy. In the native sod and on bare fields which were cropped last year the moisture is down about a foot. Wheat is growing some where not dead.

Maximum temperature, 65°; minimum, -1°; precipitation, 0.79 inch; snowfall, 5.6 inches. Precipitation, 54-year average, 0.28 inch.

GARDEN CITY:

Precipitation for the month totaled 1.31 inches; the 33-year average is only 0.26 inch. Most of this moisture, 1.14 inches, fell during one day and night in the form of rain and snow with very little, if any, run-off. The rest of the moisture fell in small amounts. There were sixteen days during which moisture fell including traces. This is the highest precipitation for January since records were started at the station in 1908. Records in town showed this month to be the highest since 1898. This moisture will be of considerable benefit to the wheat and should improve the subsoil moisture conditions.

The average maximum temperature was 41.6° which is 1.7° below the long-time average. The minimum temperature was 22.1° which is 6.6° above the long-time average. Wind velocities were low, the average for the month, 6.0 m.p.h. is 1.3 miles below the long-time average.

Stover weights were taken on the sorghums, but no threshing was done due to the moist weather conditions.

Maximum temperature, 59°; minimum, 10°; precipitation, 1.31 inches.

TUCUMCARI:

The mean temperature for January was normal, but no reading lower than 17° was recorded during the month. The average wind velocity was the lowest yet recorded for January. Precipitation of 0.75 inch was unusually high.

Conditions now are more favorable than in many years on this date. Soil moisture is excellent to a depth of about 3 feet on range land, and slightly deeper on crop land. Wheat on the plains varies from very good to failure. Where the plants have not stooled and made vigorous growth there is danger of severe soil movement. The surface soil is powdery and ashy. Cultivation, however, will be unusually easy.

Station yields in 1940 were considered good, taking into account the low precipitation. Precipitation was 12.71 inches. The average annual precipitation for the seven years 1934-40 is 12.27 inches. The long-time, 1905-40, normal has now dropped to 16.08 inches.

Dry-land milo plots in 1940 averaged 14.2 bushels to the acre, kafir plots 13.7 bushels, and corn only 3.9 bushels. MC. Sumac sorgo plots averaged 5,380 pounds of cured fodder to the acre.

Grain sorghums in the cooperative variety test ranged from 7.1 to 25.0 bushels to the acre. Averaging four plots of each variety, the range fell between 11.8 bushels and 22.1 bushels. The lower yielding varieties were the early selections, severely damaged by birds, and thus the recorded yields are somewhat less than the actual production.

In 1940 no plot on the station was replanted and all except five MC wheat and rye plots produced sufficient crop to harvest and record.

Maximum temperature, 65°; minimum, 17°; average hourly wind movement, 3.3 miles.

DALHART:

Mild, open winter weather with a near absence of dust storms characterized the month. Five showers gave a total of 0.25 inch of water. There were several heavy fogs and frosts.

Winter wheat and rye stands are still problematical. On the cropped land series, the stands show thin now but there are still a few sprouts to emerge. Reports are that wheat is not promising for stands at this time in the adjacent wheat areas; much of this acreage was seeded or reseeded following the November precipitation, and it has not had sufficient warm weather to aid germination and emergence.

Outside work during the month has consisted of tree pruning, clay hauling to roads, nursery sorghum seed threshing, and soil sampling. Soil moisture samples show that the surface four feet of soil is just about filled on cropped land. By actual comparison there is now more moisture in the soil than there has been since a similar date in 1931. The soil that season had been filled late in the fall. Incidentally the 1931 sorghum crop, which was good, was made on stored moisture, and that was the last good crop produced in this area.

Rabbits have come in hordes to graze on the rye in tree plantings. In a few cases they have also eaten on some of the more palatable species of trees. These were protected by wire enclosures as rabbits showed a preference for them. But some trees were injured overnight when this damage first became apparent. Soil blowing prevents rabbit proof fencing because of the danger of soil drifts.

Maximum temperature, 66°; minimum, 15°; mean maximum, 48°; mean minimum, 23°; mean temperature, 35°; precipitation, 0.25 inch.

BIG SPRING:

Weather during the month of January was very mild, there being only a few days when the minimum dropped below freezing. The mean for the month was 45°, or about 10° above that of January 1939. There was more damp, foggy weather during the month than has been experienced in this section in a long time. Rainfall consisting of several showers totaled 1.19 inches for the month, as compared with the average of 0.53 inch. This has furnished sufficient moisture for listing, but it has not supplied any subsoil moisture.

Many farmers are still pulling cotton bolls. The grade of the lint is very low, so the returns are very little after ginning and picking charges are paid.

Station work has consisted of plowing and listing cooperative and increase fields, building up terraces, and ginning cotton varieties and selected seed.

Maximum temperature, 73°; minimum, 22°; precipitation 1.19 inches.

LAWTON:

Precipitation was recorded on 11 days in January, bringing the monthly total to 2.42 inches. The first half of the month was predominantly cloudy and foggy, and precipitation was recorded in very small amounts. Clear weather prevailed most of the time from the 16th to the 29th but rain fell gently almost continuously on the 30th and 31st.

January temperatures were mild, with a monthly low of 23° and a mean of 4° above normal.

A very limited amount of field work was accomplished during the latter part of the month. The ground is saturated with moisture, firmly packed, and run together. Further tillage will now be delayed for some time. The first seeding of oats in the rate and date test was made January 25. The principal seedings of this crop will be made as early in February as weather and soil conditions permit.

Fall seedings of oats and barley made some winter growth, but wheat has remained mostly in a dormant condition. Although growth has been quite limited, the crop is in excellent condition. Well developed, old pustules of leaf rust are common.

Barley varieties resisted the freeze injury in November, and practically no injury is present. Several varieties of oats suffered extensive freeze injury in November, while others showed no injury whatever.

WOODWARD:

January weather was characterized by considerable cloudiness and frequent precipitation. The mean temperature was 2° above normal and precipitation totaling 2.17 inches somewhat exceeded the monthly average of 0.73 inch. Wind movement was relatively light, and no important extremes of temperature occurred.

Out-of door activities were possible most of the time, but field work was often interrupted by wet ground. Certain plots in the D. L. A. project were manured and sorghum stalks were cut in the cereal blocks. Winter wheat appeared in very good condition at the close of the month.

Over 200 evergreens were transplanted by the "balling can" method, and numerous other species were set out in the Spring Creek arboretum area. Digging and packing material for cooperative experimental plantings is well along. Recent observations indicate that a number of species of deciduous trees and shrubs were injured by an early November freeze. The vineyard trellis erected in 1917 is being reconstructed and grape replacement holes dug. Grape cuttings were obtained, and germination tests of tomatoes and vegetable seed were made.

Pasture division fencing operations at the Range Unit by C.C.C. continued intermittently. Plans for corrals and other livestock handling facilities are practically complete. Plowing 225 acres of abandoned farm land is now in progress. Sudan grass will be drilled on this tract to provide a non-competitive mulch for perennial pasture grasses to be sown in the spring of 1942. Individual seedlings from inbred and open pollinated buffalo grass selections were potted in the greenhouse.

Miscellaneous work included the construction of a soil mixing shed, making a soil sterilizing steam chest and 30 inch tree balling can, repairing sewer lines, and overhauling cars and tractors.

F.F.A. students from several western Oklahoma high schools met at the station on the 31st for crop judging competition.

John B. Sieglinger, Agronomist, Division of Cereal Crops and Diseases, moved his headquarters to the Oklahoma A. and M. College at Stillwater to assume charge of cooperative cereal investigations in this State. Mr. Sieglinger was located at the Southern Great Plains Field Station for 25 years, being widely known for his many outstanding fundamental contributions to sorghum improvement in this country.

Maximum temperature, 64°; minimum, 17°; precipitation, 2.17 inches; snowfall, 3.6 inches.

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NOTE:

Copies of the January 21 and 28 issues of the Weekly Weather and Crop Bulletin are enclosed with this news letter to each field station for attention to the interesting and valuable articles, charts, and data on droughts and precipitation.